NATIONAL BUSINESS AND TECHNICAL EXAMINATIONS BOARD (GENERAL EDUCATION EXAMINATION)

PAST QUESTIONS AND ANSWERS

GENERAL METAL WORK (191-1)

1. Explain the following terms:

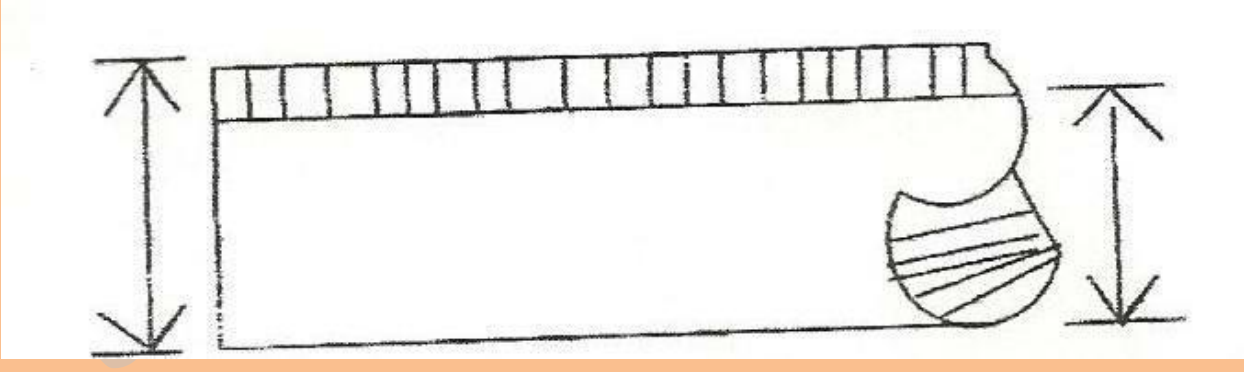
a. Tolerance
b. Actual size
c. Upper limit
d. Lower limit
e. Unilateral dimension
f. Force fit

1. **Tolerance:** This is the difference between the upper and lower limit of any dimension. It is the amount allowed for imperfection.

e.g. Upper limit – lower = Tolerance

2. **Actual Size:** This is the real dimension given to any component outside the limits. I.e (20± 0.01) mm. 20mm is the actual size of the component.

3. **Upper Limit:** This is the maximum limit on any dimension.

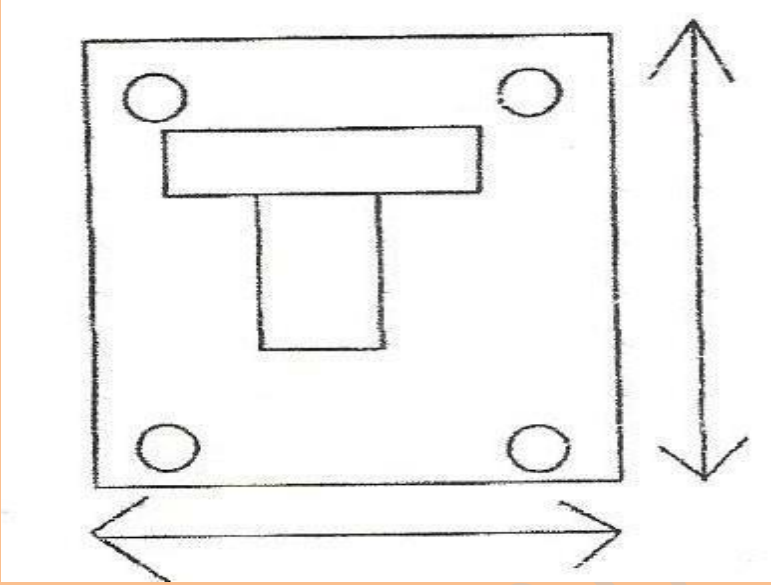


4. **Lower Limit;** This is the maximum limit on any dimension, as indicated in 1c above.

5. **Unilateral Dimension:** This is the limit given on one side of the dimension e.g. ++ or –

6. **Force Fit:** This is the type of fit in which the shaft is slighty bigger than the hole and as such little force is needed to fit the shaft into the hole e.g. the biro and the cork.

2. Write in sequential order the procedure to follow in producing the component shown below. Explain one of the procedure.



In sequential order, the procedure below can be followed in producing the above component.

1. The component is sequared (squaring)
2. The component is marked out (marking)
3. The positions of the four holes and the Tee – slot are located
4. The holes are drilled and the Tee slot chain drilled
5. The Tee is pushed out and filed to dimension

b. Sequaring is a process which involves the use of try-sequare, file and scriber in marking the components edges to be at right angle i.e at 90^0 to one another.

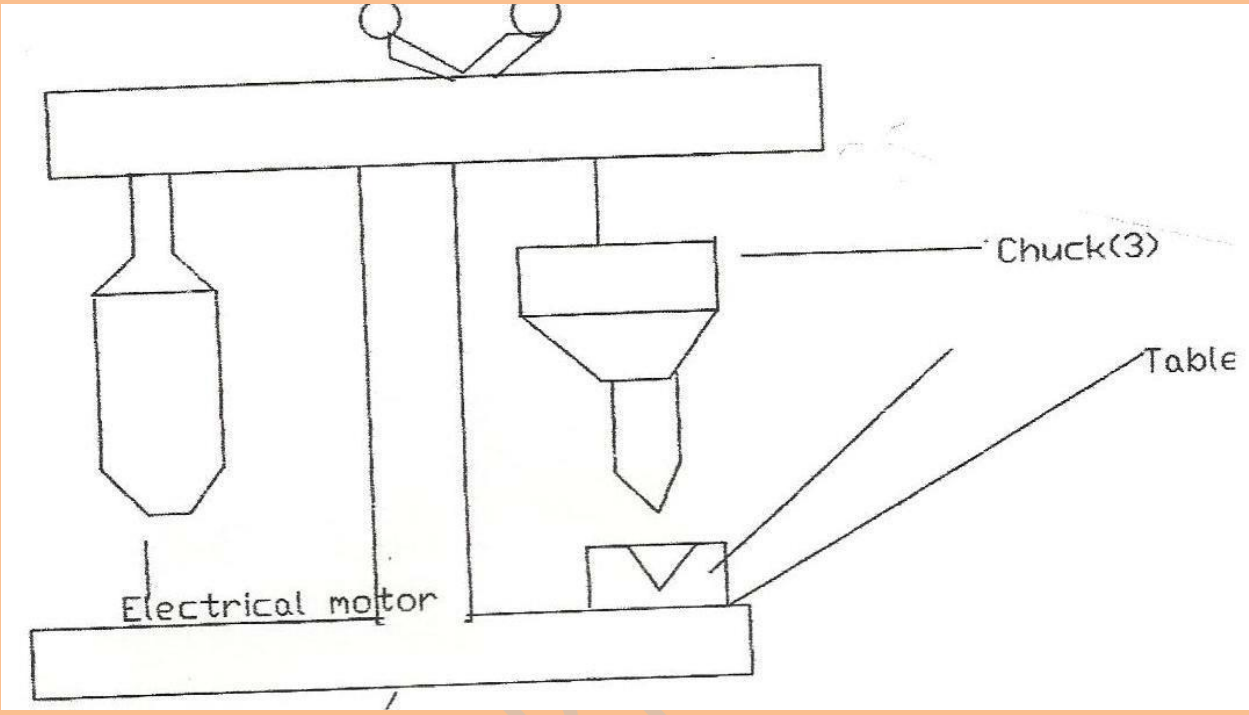
3a. What is portable electric drill?

Portable electric drill is a hand drilling machine which uses electricity to generates the motion required in the drilling. It can be carried from work to work hence the name portable electric drill.

b. State ONE other type of drilling machine used in the work shop.

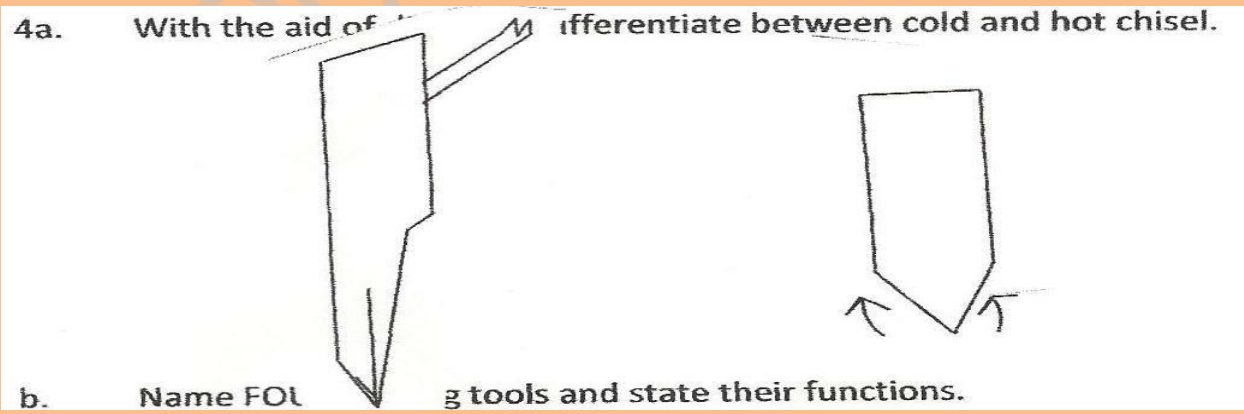
Bench Drilling machine or table drilling machine.

c. Sketch and label THREE parts of the machine stated in 3b above.



The three parts include

1. Electric motor
2. Column
3. Chuck



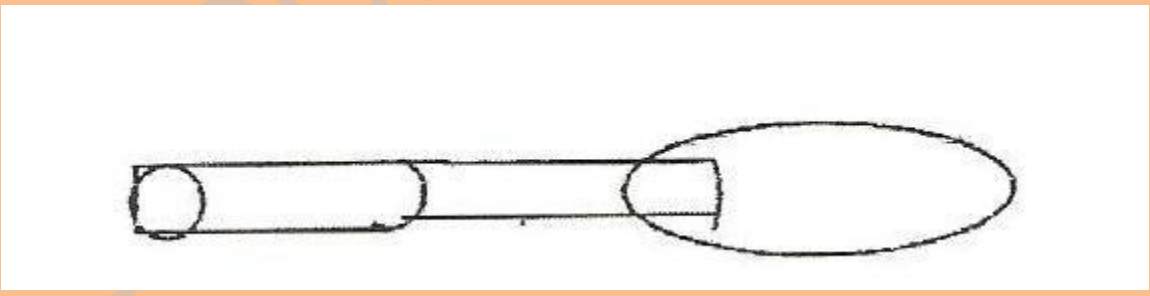
b. Name FOUR forging tools and state their functions.

	Forging Tools	Uses
1.	Set hammer	Used in confined places or on small surface
2.	Punches	This is used for making round or square holes in hot metal
3.	Flatter	Used for the finishing of flat surfaces
4.	Hollow bit tong	Used for holding round stock

5a. Name the flames associated with oxy-acetylene welding and state where each is applicable.

1. Neutral flame (Equal vol.) Oxygen and Acetylene
2. Carburizing flame (Excess Acetylene)
3. Oxidizing flame (Excess Oxygen)

1. Neutral Flame: The proper mixture of oxygen and Acetylene is used for most welds.
2. Carburizing Flame: A low temperature flame for touch brazing
3. Oxidizing Flame: This flame has an excess oxygen. The flame does not wake a strong weld and as such always harmful.



6a. Calculate the surface speed of a lathe machine having 660rev/min to be used producing a pulley having 450mm diameter.

Solution;

N = 660rev/min

S = ?

D = 450mm

But $S = \frac{\pi DN}{1000}$

$\therefore S = \frac{\pi \times 450 \times 660}{1000}$

$= \frac{3.142 \times 450 \times 660}{1000}$

$= 933.17m$

b. Explain the operation "Knurling" give sketch(s) where necessary.

Knurling is one of the operations carried out on the lathe. It involves the making of the external surface of the work piece or component rough in such a way as to enhance gripping.